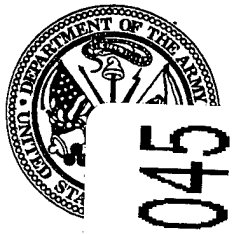
AFCTN Test Report 93-037

AFCTB-ID 92-085

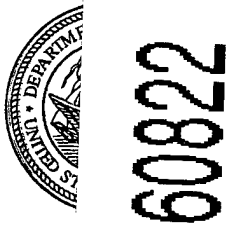
Raster Data Transfer

using:

AAI Corporation/O'Neil & Associates' Data



MIL-R-28002A (Raster)



Quick Short Test Report

30 November 1992

19960822 045

Prepared for

Electronic Systems Center

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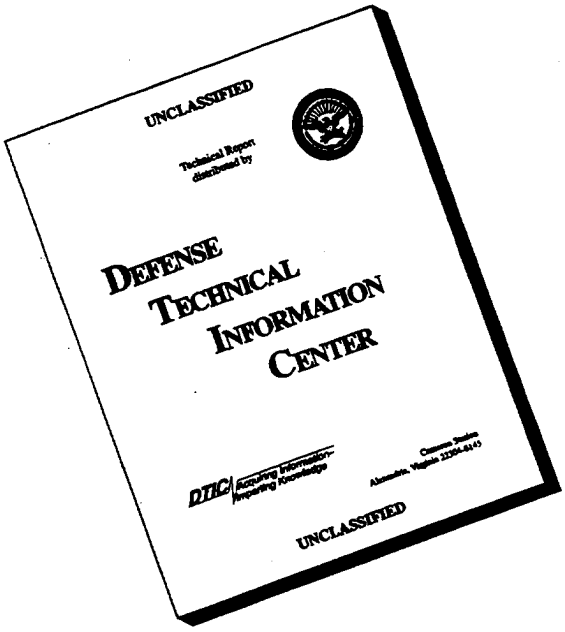

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93-037

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92-085

Raster Data Transfer
Using:
AAI Corporation/O'Neil & Associates' Data

MIL-R-28002A (Raster)

Quick Short Test Report

30 November 1992

Prepared By
Air Force CALS Test Bed
Wright-Patterson AFB, OH 45433

AFCTB Contact
Gary Lammers
(513) 427-2295

AFCTN Contact
Mel Lammers
(513) 427-2295

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Contents

1. Introduction.....1

1.1. Background.....1

1.2. Purpose.....2

2. Test Parameters.....3

3. 1840A Analysis.....5

3.1. External Packaging.....5

3.2. Transmission Envelope.....5

3.2.1. Tape Formats.....5

3.2.2. Declaration and Header Fields.....6

4. IGES Analysis.....6

5. SGML Analysis.....6

6. Raster Analysis.....6

7. CGM Analysis.....7

8. Conclusions and Recommendations.....8

9. Appendix A - Tapetool Report Logs.....9

9.1. Tape Catalog.....9

9.2. Tape Evaluation Log.....10

9.3. Tape File Set Validation Log.....18

10. Appendix B - Detailed Raster Analysis.....22

10.1. File D001R263.....22

10.1.1. Output Preview.....22

10.1.3. Output Ventura Publisher.....23

1. Introduction

1.1 Background

The Department of Defense (DoD) Air Force Continuous Acquisition and Life-cycle Support (CALS) Test Network (AFCTN) is conducting tests of the military standard for the Automated Interchange of Technical Information, MIL-STD-1840A, and its companion suite of military specifications. The AFCTN is a DoD sponsored confederation of voluntary participants from industry and government managed by the Electronic Systems Center (ESC).

The primary objective of the AFCTN is to evaluate the effectiveness of the CALS standards for technical data interchange and to demonstrate the technical capabilities and operational suitability of those standards. Two general categories of tests are performed to evaluate the standards; formal and informal.

Formal tests are large and comprehensive, which follow a written test plan, require specific authorization from the DoD, and may take months to prepare, execute, and report.

Informal tests are quick and short, used by the AFCTN technical staff, to broaden the testing base. They include representative samples of the many systems and applications used by AFCTN participants. They also allow the AFCTN staff to gain feedback from many industry and government interpretations of the standards, to increase the base of participation in the CALS initiative, and respond to the many requests for help that come from participants. Participants take part voluntarily, benefit by receiving an evaluation of their latest implementation (interpretation) of the standards, interact with the AFCTN technical staff, gain experience using the standards, and develop increased confidence in them. The results of informal tests are reported in Quick Short Test Reports (QSTRs) that briefly summarize the standard(s) tested, the hardware and software used, the nature of the test, and the results.

1.2 Purpose

The purpose of the informal test, reported in this QSTR, was to analyze AAI Corporation's interpretation and use of the CALS standards in transferring Raster data. AAI used its CALS Technical Data Interchange System to produce data, in accordance with the standards, and delivered it to the AFCTN technical staff on a 9-track magnetic tape.

2. Test Parameters

Test Plan: AFCTB 92-085

Date of Evaluation: 30 November 1992

Evaluators:
George Elwood
Air Force CALS Test Bed
Det2 HQ ESC/ENCP
Suite 200
4027 Colonel Glenn Hwy
Dayton OH 45431-1672

Data Originator:
Fran Yeager
AAI Corporation
P.O. Box 126
Hunt Valley MD 21030-0126

John Iarussi
O'Neal Associates
425 North Findley Street
Dayton OH 45404-2203

Data Description:
Technical Manual Test
1 Document Declaration file
273 Raster files

Data Source System:

Raster

HARDWARE
Unknown

SOFTWARE
Unknown

Evaluation Tools Used:

MIL-STD-1840A (TAPE)
SUN 3/280
AFCTN *Tapetool* v1.2.8 UNIX

MIL-R-28002 (Raster)
SUN SparcStation 2
ArborText *g42tiff*
AFCTN *validg4*
AFCTN *calstb.475*
IGES Data Analysis (IDA) *IGESView* 3.0
Island Graphics *IslandPaint 3.0*
Cheetah
Inset Systems *HiJaak* V2.02
Corel *Ventura Publisher*

Standards Tested:
MIL-STD-1840A
MIL-R-28002A

3. 1840A Analysis

3.1 External Packaging

The tape arrived at the Air Force CALS Test Bed (AFCTB) enclosed in a box in accordance with ASTM D 3951. The exterior of the box was not marked with the magnetic tape warning label, as required by MIL-STD-1840A, para. 5.3.1.3.

The tape was enclosed in a barrier bag as required by MIL-STD-1840A, para. 5.3.1.2. Inspection of the tape reel showed the label indicating the recording density, as required by MIL-STD-1840A, para. 5.3.1. Enclosed in the box was a packing list showing all files recorded on the tape.

3.2 Transmission Envelope

The 9-track tape received by the AFCTB contained MIL-STD-1840A files. The files were named per the standard conventions.

3.2.1 Tape Formats

The tape was run through the AFCTN *Tapetool v1.2.8* utility. 274 errors were encountered while evaluating the contents of the tape labels. All of the errors were traced to missing EOF markers in file D001. Because these records were missing, the file count was off by one.

```
*** ERROR (ANSI X3.27; 6.3.2.1) - ANSI Label EOF1 missing.

*** ERROR (ANSI X3.27; 6.3.2.1) - ANSI Label EOF2 missing.

*** ERROR (ANSI X3.27; 6.5.2) - Invalid file sequence number.
    File sequence numbers should increase by 1 for each file.
    Previous = 2; Expected = 3; Actual = 2
```

3.2.2 Declaration and Header Fields

The Document Declaration File and data record headers contained 215 errors and notes. No errors were reported in the Document Declaration File D001.

The Raster files started to report an additional space in the "srcdocid" record at file D001R029. All of the remaining files reported this error.

```
srcdocid:   50301 90026    97384 A              00010001UMEAHN
003
*** ERROR (MIL-STD-1840A; 5.1.4) - Value contains leading spaces.
*** NOTE - Correction made in new %s Header File.
```

4. IGES Analysis

No Initial Graphics Exchange Specification (IGES) files were included on this tape.

5. SGML Analysis

No Standard Generalized Markup Language (SGML) files were included on this tape.

6. Raster Analysis

Because of the number of Raster files (272) on this tape, a sample, consisted of 50 files from throughout the entire set, were tested. All selected files tested with the AFCTN *validg4* utility reported valid files.

Several files were imported and viewed using the AFCTN *calstb.475*. The images appeared straight with few orphan pixels noted.

Different files were converted using Rosetta Technologies' *Prepare* and viewed using *Preview*. No problems were encoun-

tered. A hard copy of file D001R263 is included in the Appendix of this report.

Several files were converted using Arbortext's *g42tiff* utility. No problems were noted. The resulting files were read into Island Graphics' *IslandPaint*. File D001R242 and D001R263 could not be imported because of the lack of memory on the system (32MB), which is not a problem with the file.

Several files were imported into IDA's *IGESView*. No problems were encountered until trying to print some of the files. File D001R263 generated a file system full message, which is not a problem with the file.

Several files were converted using Inset Systems' *HiJaak* to an IMG format. No problems were reported during this procedure. File D001R263 was imported into Corel's *Ventura Publisher* and printed.

The Raster files on the tape meet the CALS MIL-R-28002A specification.

7. CGM Analysis

No Computer Graphics Metafile (CGM) files were included on this tape.

8. Conclusions and Recommendations

In summary, the tape from AAI Corporation had serious errors. The missing EOF markers in the first file caused errors throughout the remainder of the tape. The majority of Raster files had additional spaces in the "srcdocid" record which were reported as an error. The tape structure does not meet the CALS MIL-STD-1840A requirements.

A sampling of the 272 Raster images was made using available tools in the AFCTB. No errors were reported during this procedure. The Raster files meet the CALS MIL-R-28002A specification.

Because of the critical errors in the tape structure, this tape does not meet the CALS MIL-STD-1840A requirements.

9. Appendix A - Tapetool Report Logs

9.1 Tape Catalog

```
CALS Test Network Catalog Evaluation - Version 1.2; Release Number 8

  Standards referenced:
    MIL-STD-1840A (1987) - Automated Interchange of Technical Information
    ANSI X3.27 (1987) - File Structure and labeling of Magnetic Tapes
                        for Information Interchange
    ANSI X3.4 (1986) - Coded Character Sets - 7 Bit ASCII

Wed Nov 25 16:52:42 1992

MIL-STD-1840A File Catalog

File Set Directory: /cals/tapetool8/Set113

                                                                    Page: 1

                                                Record
                                                Format/    Block      Selected/
File Name                File Type              Length  Length/Total  Extracted
-----------------------------------------------------------------------------
D001                     Document Declaration   D/00260 02048/000001  Extracted
D001R001                 Raster                 F/00128 02048/000014  Extracted
D001R002                 Raster                 F/00128 02048/000015  Extracted
D001R003                 Raster                 F/00128 02048/000015  Extracted
D001R004                 Raster                 F/00128 02048/000013  Extracted
D001R005                 Raster                 F/00128 02048/000017  Extracted

                    <<<<< PART OF LOG REMOVED HERE >>>>>

D001R269                 Raster                 F/00128 02048/000011  Extracted
D001R270                 Raster                 F/00128 02048/000010  Extracted
D001R271                 Raster                 F/00128 02048/000009  Extracted
D001R272                 Raster                 F/00128 02048/000012  Extracted

Catalog Process terminated normally.
```

9.2 Tape Evaluation Log

```
CALS Test Network Tape Evaluation - Version 1.2; Release Number 8
  Standards referenced:
    ANSI X3.27 (1987) - File Structure and labeling of Magnetic Tapes
                        for Information Interchange
    ANSI X3.4 (1986) - Coded Character Sets - 7 Bit ASCII

Wed Nov 25 16:45:37 1992

ANSI Tape Import Log

Allocating tape drive /dev/rmt0...

/dev/rmt0 allocated.

VOL1MGIC01                              MINIGRAPH                              4

  Label Identifier: VOL1
  Volume Identifier: MGIC01
  Volume Accessibility:
  Owner Identifier: MINIGRAPH
  Label Standard Version: 4

HDR1D001             MGIC0100010001000000 92100 00000 000000

  Label Identifier: HDR1
  File Identifier: D001
  File Set Identifier: MGIC01
  File Section Number: 0001
  File Sequence Number: 0001
  Generation Number: 0000
  Generation Version Number: 00
  Creation Date:  92100
  Expiration Date:  00000
  File Accessibility:
  Block Count: 000000
  Implementation Identifier:

HDR2D0204800260                                    00

  Label Identifier: HDR2
  Recording Format: D
  Block Length: 02048
  Record Length: 00260
  Offset Length: 00
```

```
************ Tape Mark ***************

  Actual Block Size Found = 2048 Bytes.

  Number of data blocks read = 1.

************ Tape Mark ***************

HDR1D001R001          MGIC0100010002000000 92100 00000 000000

  Label Identifier: HDR1
  File Identifier: D001R001
  File Set Identifier: MGIC01
  File Section Number: 0001
  File Sequence Number: 0002
  Generation Number: 0000
  Generation Version Number: 00
  Creation Date:  92100
  Expiration Date:  00000
  File Accessibility:
  Block Count: 000000
  Implementation Identifier:

HDR2F0204800128                                    00

  Label Identifier: HDR2
  Recording Format: F
  Block Length: 02048
  Record Length: 00128
  Offset Length: 00

************ Tape Mark ***************

*** ERROR (ANSI X3.27; 6.3.2.1) - ANSI Label EOF1 missing.

*** ERROR (ANSI X3.27; 6.3.2.1) - ANSI Label EOF2 missing.

HDR1D001R001          MGIC0100010002000000 92100 00000 000000

  Label Identifier: HDR1
  File Identifier: D001R001
  File Set Identifier: MGIC01
  File Section Number: 0001
  File Sequence Number: 0002
  Generation Number: 0000
  Generation Version Number: 00
```

```
  Creation Date:  92100
  Expiration Date:  00000
  File Accessibility:
  Block Count: 000000
  Implementation Identifier:

*** ERROR (ANSI X3.27; 6.5.2) - Invalid file sequence number.
    File sequence numbers should increase by 1 for each file.
    Previous = 2; Expected = 3; Actual = 2

HDR2F0204800128                                    00

  Label Identifier: HDR2
  Recording Format: F
  Block Length: 02048
  Record Length: 00128
  Offset Length: 00

************ Tape Mark ***************

  Actual Block Size Found = 2048 Bytes.

  Number of data blocks read = 14.

************ Tape Mark ***************

EOF1D001R001         MGIC0100010002000000 92100 00000 000014

  Label Identifier: EOF1
  File Identifier: D001R001
  File Set Identifier: MGIC01
  File Section Number: 0001
  File Sequence Number: 0002
  Generation Number: 0000
  Generation Version Number: 00
  Creation Date:  92100
  Expiration Date:  00000
  File Accessibility:
  Block Count: 000014
  Implementation Identifier:

EOF2F0204800128                                    00

  Label Identifier: EOF2
  Recording Format: F
  Block Length: 02048
  Record Length: 00128
```

```
  Offset Length: 00

************ Tape Mark ***************

HDR1D001R002          MGIC0100010003000000 92100 00000 000000

  Label Identifier: HDR1
  File Identifier: D001R002
  File Set Identifier: MGIC01
  File Section Number: 0001
  File Sequence Number: 0003
  Generation Number: 0000
  Generation Version Number: 00
  Creation Date:  92100
  Expiration Date:  00000
  File Accessibility:
  Block Count: 000000
  Implementation Identifier:

*** ERROR (ANSI X3.27; 6.5.2) - Invalid file sequence number.
    File sequence numbers should increase by 1 for each file.
    Previous = 3; Expected = 4; Actual = 3

HDR2F0204800128                                    00

  Label Identifier: HDR2
  Recording Format: F
  Block Length: 02048
  Record Length: 00128
  Offset Length: 00

************ Tape Mark ***************

  Actual Block Size Found = 2048 Bytes.

  Number of data blocks read = 15.

************ Tape Mark ***************

EOF1D001R002          MGIC0100010003000000 92100 00000 000015

  Label Identifier: EOF1
  File Identifier: D001R002
  File Set Identifier: MGIC01
  File Section Number: 0001
  File Sequence Number: 0003
  Generation Number: 0000
```

```
  Generation Version Number: 00
  Creation Date:  92100
  Expiration Date:  00000
  File Accessibility:
  Block Count: 000015
  Implementation Identifier:

EOF2F0204800128                                    00

  Label Identifier: EOF2
  Recording Format: F
  Block Length: 02048
  Record Length: 00128
  Offset Length: 00

************ Tape Mark ***************

HDR1D001R003          MGIC0100010004000000 92100 00000 000000

  Label Identifier: HDR1
  File Identifier: D001R003
  File Set Identifier: MGIC01
  File Section Number: 0001
  File Sequence Number: 0004
  Generation Number: 0000
  Generation Version Number: 00
  Creation Date:  92100
  Expiration Date:  00000
  File Accessibility:
  Block Count: 000000
  Implementation Identifier:

*** ERROR (ANSI X3.27; 6.5.2) - Invalid file sequence number.
    File sequence numbers should increase by 1 for each file.
    Previous = 4; Expected = 5; Actual = 4

HDR2F0204800128                                    00

  Label Identifier: HDR2
  Recording Format: F
  Block Length: 02048
  Record Length: 00128
  Offset Length: 00

************ Tape Mark ***************

  Actual Block Size Found = 2048 Bytes.
```

```
  Number of data blocks read = 15.

************ Tape Mark ***************

EOF1D001R003          MGIC0100010004000000 92100 00000 000015

  Label Identifier: EOF1
  File Identifier: D001R003
  File Set Identifier: MGIC01
  File Section Number: 0001
  File Sequence Number: 0004
  Generation Number: 0000
  Generation Version Number: 00
  Creation Date:  92100
  Expiration Date:  00000
  File Accessibility:
  Block Count: 000015
  Implementation Identifier:

EOF2F0204800128                                    00

  Label Identifier: EOF2
  Recording Format: F
  Block Length: 02048
  Record Length: 00128
  Offset Length: 00

************ Tape Mark ***************

                              <<<<< PART OF LOG REMOVED HERE >>>>>

************ Tape Mark ***************

HDR1D001R272          MGIC0100010273000000 92100 00000 000000

  Label Identifier: HDR1
  File Identifier: D001R272
  File Set Identifier: MGIC01
  File Section Number: 0001
  File Sequence Number: 0273
  Generation Number: 0000
  Generation Version Number: 00
  Creation Date:  92100
  Expiration Date:  00000
  File Accessibility:
  Block Count: 000000
```

```
  Implementation Identifier:

*** ERROR (ANSI X3.27; 6.5.2) - Invalid file sequence number.
    File sequence numbers should increase by 1 for each file.
    Previous = 273; Expected = 274; Actual = 273

HDR2F0204800128                                    00

  Label Identifier: HDR2
  Recording Format: F
  Block Length: 02048
  Record Length: 00128
  Offset Length: 00

********** Tape Mark **********

  Actual Block Size Found = 2048 Bytes.

  Number of data blocks read = 12.

********** Tape Mark **********

EOF1D001R272         MGIC0100010273000000 92100 00000 000012

  Label Identifier: EOF1
  File Identifier: D001R272
  File Set Identifier: MGIC01
  File Section Number: 0001
  File Sequence Number: 0273
  Generation Number: 0000
  Generation Version Number: 00
  Creation Date:  92100
  Expiration Date:  00000
  File Accessibility:
  Block Count: 000012
  Implementation Identifier:

EOF2F0204800128                                    00

  Label Identifier: EOF2
  Recording Format: F
  Block Length: 02048
  Record Length: 00128
  Offset Length: 00

********** Tape Mark **********
```

```
************ Tape Mark ***************

############ End of Volume MGIC01 ###############

############ End Of Tape File Set ###############

Deallocating /dev/rmt0...

Tape Import Process terminated with 274 error(s), 0 warning(s),
and 0 note(s).
```

9.3 Tape File Set Validation Log

```
CALS Test Network File Set Evaluation - Version 1.2; Release Number 8
  Standards referenced:
    MIL-STD-1840A (1987) - Automated Interchange of Technical Information
    MIL-R-28002 (1989) - Raster Graphics Representation In Binary
                         Format, Requirements For

Wed Nov 25 16:52:44 1992

MIL-STD-1840A File Set Evaluation Log

File Set: Set113

Found file: D001
Extracting Document Declaration Header Records...
Evaluating Document Declaration Header Records...

srcsys: MINIGRAPH Inc.
srcdocid: AAI92A
srcrelid: NONE
chglvl: ORIGINAL
dteisu: 19921009
dstsys: AF'S EDCARS SYSTEM
dstdocid: F-16 DRLMS
dstrelid: NONE
dtetrn: 19921009
dlvacc: NONE
filcnt: R272
ttlcls: Unclassified
doccls: Unclassified
doctyp: Engineering drawings
docttl: F-16 DRLMS


Found file: D001R001
Extracting Raster Header Records...
Evaluating Raster Header Records...

srcdocid: PL9156972        98747 -              00010001UMEAHN
dstdocid: NONE
txtfilid: NONE
figid: NONE
srcgph: NONE
doccls: NONE
rtype: 1
```

```
rorient: 270,270
rpelcnt: 001632,001608
rdensty: 0200
notes: for srcdocid description see MIL-STD-804C;

Saving Raster Header File: D001R001_HDR
Saving Raster Data File: D001R001_GR4

Found file: D001R002
Extracting Raster Header Records...
Evaluating Raster Header Records...

srcdocid: PL9156972        98747 -              00010001UMEAHN
dstdocid: NONE
txtfilid: NONE
figid: NONE
srcgph: NONE
doccls: NONE
rtype: 1
rorient: 270,270
rpelcnt: 001632,001608
rdensty: 0200
notes: for srcdocid description see MIL-STD-804C;

Saving Raster Header File: D001R002_HDR
Saving Raster Data File: D001R002_GR4

                    <<<<< PART OF LOG REMOVED HERE >>>>>

Found file: D001R029
Extracting Raster Header Records...
Evaluating Raster Header Records...

srcdocid:   40133 40020    97384 -              00010001UMEAHN
*** ERROR (MIL-STD-1840A; 5.1.4) - Value contains leading spaces.
*** NOTE - Correction made in new %s Header File.
dstdocid: NONE
txtfilid: NONE
figid: NONE
srcgph: NONE
doccls: NONE
rtype: 1
rorient: 270,270
rpelcnt: 001632,001608
rdensty: 0200
notes: for srcdocid description see MIL-STD-804C;
```

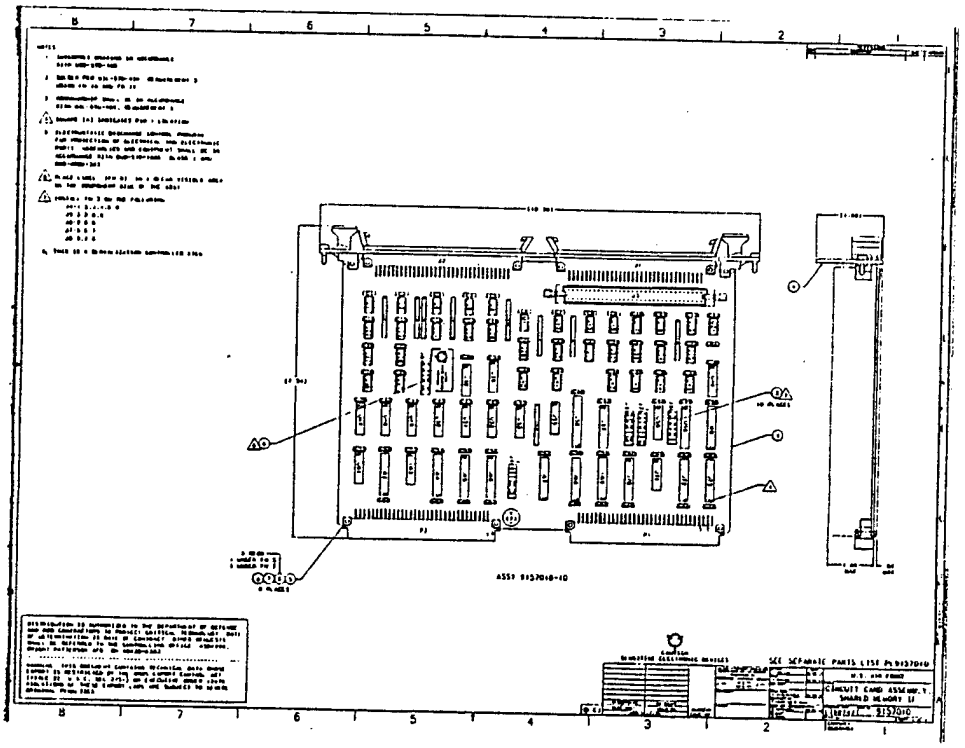
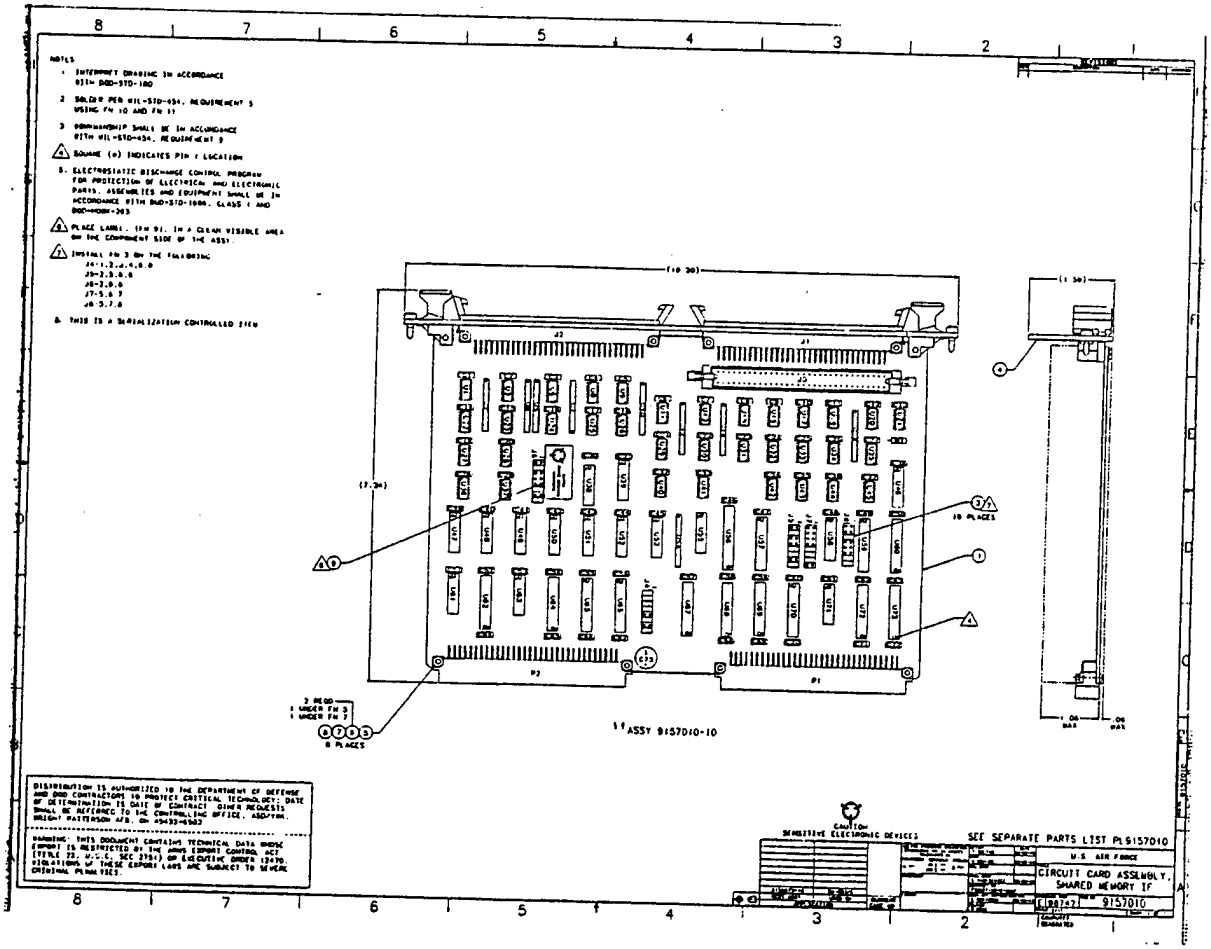
```
1 error(s), 0 warning(s), and 1 note(s) were encountered
 in Raster File D001R029.
Saving Raster Header File: D001R029_HDR
Saving Raster Data File: D001R029_GR4

                    <<<<< PART OF LOG REMOVED HERE >>>>>

Found file: D001R270
Extracting Raster Header Records...
Evaluating Raster Header Records...

srcdocid:   50301 90026    97384 -              00010001UMEAHN
*** ERROR (MIL-STD-1840A; 5.1.4) - Value contains leading spaces.
*** NOTE - Correction made in new %s Header File.
dstdocid: NONE
txtfilid: NONE
figid: NONE
srcgph: NONE
doccls: NONE
rtype: 1
rorient: 270,270
rpelcnt: 001632,001608
rdensty: 0200
notes: for srcdocid description see MIL-STD-804C;

1 error(s), 0 warning(s), and 1 note(s) were encountered
 in Raster File D001R270.
Saving Raster Header File: D001R270_HDR
Saving Raster Data File: D001R270_GR4

Found file: D001R271
Extracting Raster Header Records...
Evaluating Raster Header Records...

srcdocid:   50301 90026    97384 -              00010001UMEAHN
*** ERROR (MIL-STD-1840A; 5.1.4) - Value contains leading spaces.
*** NOTE - Correction made in new %s Header File.
dstdocid: NONE
txtfilid: NONE
figid: NONE
srcgph: NONE
doccls: NONE
rtype: 1
rorient: 270,270
rpelcnt: 001632,001608
rdensty: 0200
notes: for srcdocid description see MIL-STD-804C;
```

```
1 error(s), 0 warning(s), and 1 note(s) were encountered
 in Raster File D001R271.
Saving Raster Header File: D001R271_HDR
Saving Raster Data File: D001R271_GR4

Found file: D001R272
Extracting Raster Header Records...
Evaluating Raster Header Records...

srcdocid:   50301 90026    97384 A              00010001UMEAHN
*** ERROR (MIL-STD-1840A; 5.1.4) - Value contains leading spaces.
*** NOTE - Correction made in new %s Header File.
dstdocid: NONE
txtfilid: NONE
figid: NONE
srcgph: NONE
doccls: NONE
rtype: 1
rorient: 270,270
rpelcnt: 001632,001608
rdensty: 0200
notes: for srcdocid description see MIL-STD-804C;

1 error(s), 0 warning(s), and 1 note(s) were encountered
 in Raster File D001R272.
Saving Raster Header File: D001R272_HDR
Saving Raster Data File: D001R272_GR4

Evaluating numbering scheme...
No errors were encountered during numbering scheme evaluation.
Numbering scheme evaluation complete.

Checking file count...
No errors were encountered during file count verification.
File Count verification complete.

A total of 215 error(s), 0 warning(s), and 215 note(s) were
encountered in Document D001.

A grand total of 215 error(s), 0 warning(s), and 215 note(s) were
encountered in this File Set.

MIL-STD-1840A File Set Evaluation Complete.
```

10. Appendix B - Detailed Raster Analysis

10.1 File D001R263

10.1.1 Output Preview



10.1.2 Output Ventura Publisher